REMARKS

The claims presently pending are Claims 1-33. No amendments have been made to the claims. Claims 1, 2, 6, 7, 15, 19, 20, 23 and 29 are finally rejected, and Claims 3-5, 8-14, 16-18, 21, 22, 24-28 and 30-33 are objected to. Reconsideration is respectfully requested.

I. ALLOWABLE CLAIMS

The Applicants thank the Examiner for the indication that Claims 3-5, 8-14, 16-18, 21, 22, 24-28 and 30-33 would be allowable if rewritten in independent form to incorporate the elements of their respective base claims and any intervening claims. However, since the Applicants believe that the remaining claims in this application are patentable, the Applicants have not rewritten Claims 3-5, 8-14, 16-18, 21, 22, 24-28 and 30-33 in independent form.

II. REJECTION UNDER 35 U.S.C. § 102

Claims 1, 6, 7, 15, 19, 20, 23 and 29 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Wang (U.S. Patent No. 6,781,626). Applicants respectfully traverse this rejection, for all of the reasons set forth in Applicants' earlier Amendment mailed on March 2, 2005, and for the further reasons set forth below.

A cited prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. MPEP § 2131; *In re Bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990). Anticipation is only shown where each and every limitation of the claimed invention is found in a single cited prior art reference. MPEP § 2131; *In re Donohue*, 766 F.2d 531, 534, 226 U.S.P.Q. 619, 621 (Fed. Cir. 1985).

Claim 1 recites that, for a given pixel, there are determined first and second edge-orientations of first and second colors, respectively. The first and second edge-orientations are used to determine an interpolation orientation. Claims 6, 7, 15, 19, 20, 23 and 29 recite a first set of first color values and a second set of second color values. For a given one of the first color values associated with a given pixel location, first and second degrees of change are determined using the first and second sets of color values, respectively. The first and second degrees of change are used to determine an interpolation orientation. The above-described exemplary features of Claims 1, 6, 7, 15, 19, 20, 23 and 29 have not been found in Wang.

As best understood, the Office Action appears to allege that Wang's local intensity gradient corresponds to one edge-orientation recited in independent Claim 1, and that Wang's continuity bias corresponds to the other edge-orientation recited in Claim 1. Similarly, as best understood, the Office Action appears to allege that Wang's local intensity gradient corresponds to one degree of change recited in independent Claims 6 and 19, and that Wang's continuity bias corresponds to the other degree of change recited in Claims 6 and 19. Applicants disagree with this reading of Wang with respect to Claims 1, 6 and 19, as explained in detail below.

Turning now to a more detailed consideration of Wang, the local intensity gradient for the pixel X of Wang Figures 5 and 6 is defined in the pseudo code steps 110 (vertical component) and 120 (horizontal component) shown below Wang columns 7 and 8. As clearly shown, the local intensity gradient includes first and second pixel value differences, one (G2-G4) oriented in the horizontal direction relative to pixel X, and the other (G1-G3) oriented in the vertical direction relative to pixel X.

Wang also defines for each pixel of the array a continuity measure, C(i, j), where i and j represent the row and column where the corresponding pixel is located in the array.

Wang column 8, lines 39-43. It should be noted in this connection that the Office Action appears to be mistaken insofar as it alleges that the symbol C(i, j) specifies some sort of two-dimensional parameter composed of constituent row and column components that are respectively represented by the indices i and j.

In fact, and as mentioned in the aforementioned Amendment mailed on March 2, 2005, the symbol C(i, j) is, in every instance, simply a one-dimensional parameter that identifies only a single numerical value oriented in a single direction. In particular, C(i, j) is a signed integer value, and the sign of the integer value (positive or negative) identifies the directional orientation (horizontal or vertical). Wang column 7, lines 45-52. Thus, although different instances of C(i, j) can specify different directional orientations (a horizontal/row orientation or a vertical/column orientation), nevertheless, any single instance of C(i, j) can only specify one directional orientation. The i and j indices merely identify the pixel location to which the one-dimensional parameter C(i, j) corresponds.

It should also be noted that the aforementioned integer value and its sign, as specified by C(i, j) for any given pixel location, will depend upon the interpolation direction selected for that pixel location. So the continuity measure C(i, j) for pixel X of Figures 5 and 6 cannot be determined until after the interpolation direction has been determined for pixel X. Wang column 9, lines 29-39; column 9, line 40 - column 10, line 20; pseudo code 130-180 and 210-260 below column 8 and above column 9. In contrast to this, Applicants' claims recite that the edge-orientations (Claim 1) and degrees of change (Claims 6 and 19) are used to determine the interpolation orientation for the associated pixel. Accordingly, Wang's continuity measure cannot be held to correspond to the edge-orientations or degrees of change recited in Applicants' claims.

In order to determine the interpolation direction for a given pixel, Wang uses the local intensity gradient (pseudo code 110 and 120 below columns 7 and 8) in combination with a

continuity bias. Continuing with the example of pixel X of Figures 5 and 6, the continuity bias Bc used for pixel X is defined by pseudo code 100 below Wang columns 7 and 8. More specifically, the continuity bias Bc is a weighted sum of selected continuity measures C1-C4 (see also Figure 5), each of which has been determined for a respectively corresponding pixel other than pixel X. Wang Figure 5; column 8, lines 39-42; and column 9, lines 17-20.

It appears that the Wang continuity measures, such as C1-C4 of Figure 5, take integer values in a range from 1 to Cmax (either positive or negative). Wang column 9, lines 38-40; column 10, lines 20-23; and pseudo code 200 and 280 above column 9. The Wang continuity measures appear to merely count, in unit increments, cumulative trending of the interpolation directions that have been selected for the respective pixels of the array. The count is reset at a given pixel if the interpolation direction selected for that pixel constitutes a change in the current trend. Wang column 9, lines 26-39; column 9, line 40 – column 10, line 20; and pseudo code 140-180 and 220-260 below column 8 and above column 9. It appears that the value of Cmax needs to be large enough to permit the continuity measures to represent the longest cumulative trend that is sought to be captured. This longest cumulative trend would simply be a count of a number of pixel locations. *Id.*

As mentioned above, each of the horizontal and vertical components of Wang's local intensity gradient quantifies a difference between two actual pixel values from the array. These components can therefore take values that range from zero to the largest possible difference between pixel values. The horizontal and vertical components of Wang's local intensity gradient can thus be seen to represent a phenomenon, namely a difference in pixel intensity values, whose essence differs from that of the phenomenon represented by Wang's continuity measure, namely a running incremental count of pixel locations for which the same interpolation direction has been selected.

Due to the aforementioned dissimilarities between the local intensity gradients and the continuity measures, the numerical values associated with a given local intensity gradient may well be quite different from (i.e., much larger than) the numerical value of a given continuity measure. Ultimately, however, in order to determine the interpolation direction for pixel X, Wang uses a single mathematical inequality to set up a comparison among the local intensity gradient components that have been computed for pixel X and weighted versions of selected continuity measures that have been computed for pixels other than pixel X. This can be seen from the pseudo code 100, 110, 120 and 130 below columns 7 and 8. (Wang uses the term "continuity bias", and the corresponding symbol Bc, to refer collectively to the weighted versions of the selected continuity measures.) Wang provides weighting coefficients (a1-a4) which operate to produce the weighted versions of the selected continuity measures, as shown by the aforementioned pseudo code 100. The weighting coefficients apparently scale the cumulative trending numbers contained in the continuity measures into weighted numerical values that are more commensurate with, and thus more suitable for meaningful comparison to, the numerical values of the intensity gradient components. The comparison is effectuated by the mathematical inequality shown in the aforementioned pseudo code 130.

As described above, Wang uses the local intensity gradient and the continuity bias to determine the interpolation direction. However, and as demonstrated in detail above, Wang's continuity bias clearly differs in its essence from Wang's local intensity gradient. On the other hand, independent Claim 1 plainly recites that a first edge-orientation and a second edge-orientation are used to determine the interpolation orientation, and independent Claims 6 and 19 plainly recite that a first degree of change and a second degree of change are used to determine the interpolation orientation.

In view of the foregoing explication of the essentially different natures of Wang's continuity bias and his local intensity gradient, Applicants submit that Wang's continuity bias

cannot fairly be held to correspond to the second edge-orientation of Claim 1, particularly while at the same time also holding that Wang's local intensity gradient corresponds to the first edge-orientation of Claim 1. Similarly, Wang's continuity bias cannot fairly be held to correspond to the second degree of change of Claims 6 and 19, particularly while at the same time also holding that Wang's local intensity gradient corresponds to the first degree of change of Claims 6 and 19. Applicants believe that such a reading of Wang, which is apparently adopted in the Office Action, does not adequately reconcile the plain meaning of Applicants' aforementioned claim language with the fact that, in Wang, the continuity bias differs in its essential nature from the local intensity gradient.

Therefore, Applicants' submit that the Office Action has failed to demonstrate anticipation of each and every element of independent Claims 1, 6 and 19 (and their dependent claims) arranged as they are in the claims. Accordingly, the Applicant respectfully requests the Examiner withdraw the § 102(e) rejection of Claims 1, 6, 7, 15, 19, 20, 23 and 29.

III. REJECTION UNDER 35 U.S.C. § 103

Claim 2 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang in view of Shinohara et al. (article entitled "Color Image Analysis in a Vector Field"). Applicant respectfully traverses this rejection.

A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art. *In re Bell*, 991 F.2d 781, 783, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.

Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2142.

Claim 2 depends from Claim 1, and thus includes all of the limitations of Claim 1. Shinohara et al fails to remedy the above-described deficiencies of Wang with respect to Claim 1. Applicants therefore submit that the § 103 rejection of Claim 2 is overcome, and withdrawal of that rejection is respectfully requested.

IV. CONCLUSION

Thus, all grounds of rejection and/or objection are traversed or accommodated, and favorable reconsideration and allowance are respectfully requested. Should the Examiner have any further questions or comments facilitating allowance, the Examiner is invited to contact Applicant's representative indicated below to further prosecution of this application to allowance and issuance.

Respectfully submitted,

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